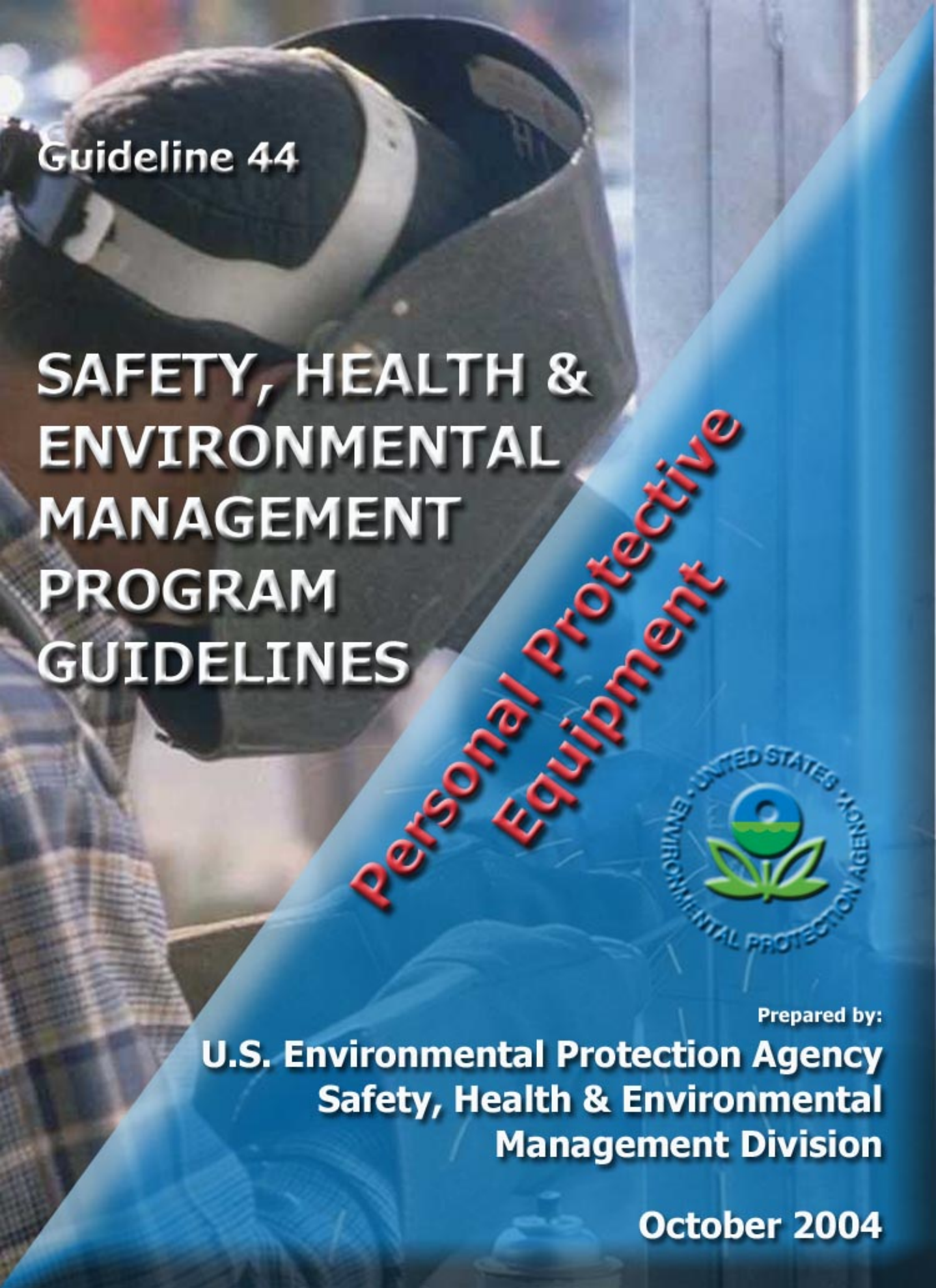

Guideline 44

SAFETY, HEALTH & ENVIRONMENTAL MANAGEMENT PROGRAM GUIDELINES

Personal Protective Equipment

Prepared by:

U.S. Environmental Protection Agency
Safety, Health & Environmental Management Division

October 2004

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SAFETY, HEALTH AND ENVIRONMENTAL MANAGEMENT PROGRAM GUIDE

POTENTIAL PROGRAM APPLICABILITY		
Office ○	Laboratory ●	Field ●

Guide No.	**44**
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PERSONAL PROTECTIVE EQUIPMENT

SCOPE OF THE PROGRAM

The personal protective equipment (PPE) program applies to all Agency personnel who are required to wear PPE, including chemical protective clothing, and protection for eyes, face, head, and extremities.

The PPE program requires a hazard assessment of work areas to determine if PPE is required. In addition, the required training provided to all affected employees shall include proper use, maintenance and care of PPE.

Note: This PPE program does not address respiratory, electrical, or noise protection. Refer to the Program Guides on these topics for more information.

REGULATORY REQUIREMENTS

The key or basic elements of this program required by law and/or EPA policy are:

- Implementation of a facility-specific PPE program
- Workplace assessments, including re-assessments, to determine if hazards are present which necessitate the use of PPE
- Written certification that workplace hazard assessments have been conducted
- Selection of the appropriate PPE to protect against the various identified hazards.
- Written certification of training and re-training for all employees required to wear PPE.
- Availability of various types and sizes of selected PPE.

AUTHORITIES

The following laws and regulations are the sources of legal authority that establish the applicability and requirements of this program.

- 29 CFR 1910, Subpart I, Personal Protective Equipment
- 29 CFR 1960, Federal Employee Occupational Safety and Health Programs
- Executive Order 12196, Occupational Safety and Health Programs for Federal Employees

REFERENCES

These documents and other sources of information can help you implement this program.

- American Conference of Governmental Industrial Hygienists (ACGIH), Guidelines for Selection of Chemical Protective Clothing
- ACGIH, Quick Selection Guide to Chemical Protective Clothing,
- OSHA, Personal Protective Equipment, OSHA 3151, 2004

IMPLEMENTATION ACTIVITIES

The following list provides an overview of the activities that this program will require:

- Perform a workplace hazard assessment, identify potential hazards, and determine appropriate PPE required
- Select appropriate PPE that properly fits each affected individual

- Provide training to all affected employees including, maintenance, care, and proper use of PPE
- Provide re-training, as necessary
- Written certification verifying PPE users have received, and demonstrated understanding of the training.

IMPLEMENTATION IMPLICATIONS

The following activities are required for start-up programs:

- Conduct workplace hazard assessments to determine if PPE is required
- Develop training curricula
- Develop PPE program
- Purchase PPE
- Train personnel.

Guideline 44
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Section 44-01
Background

PURPOSE OF SHEMP GUIDELINES

The Safety, Health and Environmental Management Program (SHEMP) Guidelines:

- Provide management, union officials, SHEMP managers, and other Agency employees with interpretations of Federal statutes, Executive Orders, and other regulatory mandates
- Explain the application of these interpretations to EPA's mission-oriented activities
- Provide strategies, procedures, and management tools to comply with the regulatory mandates and integrate them into facility management systems.

OBJECTIVES OF SHEMP GUIDELINES

The objectives of the SHEMP Guidelines are to:

- Streamline administrative requirements and decrease the burden on EPA's field units, which will provide flexibility to Regional and Program Office Designated SHEMP Officials in designing their programs
- Translate regulatory mandates into a series of technical interpretations and explanations applicable to EPA's mission-related activities
- Provide up-to-date content and program materials that can be integrated into management systems, and establish additional technical resources, self-assessment guides, and program tools that support facility management systems.

GUIDELINES STRUCTURE

The SHEMP Guidelines consist of several dozen chapters. Each chapter addresses a specific mandate (e.g., Clean Air Act, National Environmental Policy Act), an EPA Order, or technical and administrative topics not specifically covered in a mandate or Order (e.g., ergonomics, accident investigation). Implementation tools, such as guidelines, forms, and checklists, are found in appendices, and usually listed as non-mandatory guidelines. EPA managers are encouraged to follow these non-mandatory guidelines.

Each chapter begins with a two-page summary called the Program Guide. This guide serves as a quick reference for the scope or applicability of the chapter, including the regulatory requirements and corresponding authorities. It also provides some implementation guidance for the chapter.

Additional information regarding the organization of the SHEMP Guidelines, the role of the Safety, Health and Environmental Management Division (SHEMD) and the SHEMP is available in Guidelines 1 and 2. Additional information about EPA's Environmental and Safety and Health Management Systems can be found in the Guidelines developed for those systems.

Section 44-02
Introduction

PURPOSE

This personal protective equipment (PPE) Guideline ensures that SHEMD provides all affected employees PPE for eyes, face, head and extremities to protect against workplace hazards capable of causing injury to or impairment of any part of the body.

This Guideline may be used in conjunction with the following SHEMP Guidelines:

- Guideline 23, Chemical Handling, Storage, and Hazard Communication
- Guideline 24, Laboratory Chemical Hygiene Program
- Guideline 50, Federal Employee Occupational Safety and Health Program (29 CFR Part 1960).

These Guidelines replace the corresponding technical material in EPA Order 1440, Occupational Health and Safety Manual.

SCOPE

This Guideline applies to all EPA employees who are required to use PPE to perform all or part of their assigned duties.

MANAGEMENT SYSTEMS APPLICABILITY

Many EPA facilities have implemented Environmental Management Systems (EMS) and Safety and Health Management Systems (SHMS). These systems are based on well established standards and best practices that prescribe a 'plan-do-check-act' structure.

The SHEMP Guidelines have been promulgated to assist EPA's SHEMP staff in the management of potential and existing regulated safety, health and environmental aspects (similar to hazards) at EPA facilities. These Guidelines include techniques and best management practices that can be selectively applied to facility management systems according to applicability, and specific facility operations.

USING THE SHEMP GUIDELINES FOR YOUR MANAGEMENT SYSTEM

The information in the SHEMP Guidelines is directly applicable to a number of EMS/SHMS elements. Individuals implementing or working on an EMS or SHMS should refer to the Guidelines when supporting or developing elements of their system. Where a Guideline contains information that is potentially applicable to the

system, it should be discussed further with SHEMP staff. SHEMP staff shall confirm whether approaches, programs, or controls described by the guidelines have been implemented, in which case the Guidelines may be referenced. If applicable guidance has not been implemented at the facility, SHEMP staff may provide insight on efficient or effective approaches to develop the guidance as part of the EMS or SHMS.

Specifically, the SHEMP Guidelines may apply to the following management system processes:

- *Identifying aspects associated with facility operations.* The SHEMP Guidelines describe safety, health and environmental issues which various authorities have determined to be important. Accordingly, staff supporting management systems may use the Guidelines as a resource for the identification of system "aspects" related to employee safety and health, or to the environment (e.g., slips, trips, and falls, or air emissions).

- *Determining legal and other requirements.* The implementation of an EMS or SHMS requires the determination of legal and other requirements for all of the employee safety and health and environmental aspects. The SHEMP Guidelines contain information that could assist individuals in determining these legal and other requirements (See Authorities below).

- *Developing objectives and targets.* The SHEMP Guidelines describe regulatory requirements and best practices for safety, health and environmental management. Staff developing objectives and targets for their management system may find these requirements and best practices informative and useful when establishing a management system.

- *Developing management programs.* The SHEMP Guidelines define roles and responsibilities of key personnel, list training and record keeping requirements, and provide maintenance guidance (e.g., housekeeping, facility maintenance), which are directly applicable to the development of management programs.

- *Applying operational controls.* The SHEMP Guidelines contain procedures, checklists, techniques, and administrative and engineering methods for controlling aspects. These operational controls may be incorporated into the EMS or

SHMS to control potential safety, health, and environmental impacts.

OPERATIONAL CONTROLS

Operational controls include administrative controls that specify operating criteria (such as instructions, procedures, and maintenance programs), or engineering controls that maintain operating conditions (such as valves and monitors). Operational controls ensure that aspects (or hazards) associated with an operation or activity meet specified criteria or level. In practice this ensures that safety and health and environmental risks are avoided/minimized as part of the operation or activity. The following operational controls shall be reviewed to determine applicability to management systems.

- PPE hazard assessment protocol
- Written certification of employee training
- Other operating procedures.

AUTHORITIES

The following laws and regulations are the sources of the legal authority that establish applicability and requirements for this program:

- 29 CFR 1910, Subpart I, Personal Protective Equipment
- 29 CFR 1960, Federal Employee Occupational Safety and Health Programs
- Executive Order 12196, Occupational Safety and Health Programs for Federal Employees.

DEFINITIONS

The following definitions are used throughout this Guideline:

Face Shield — Protective equipment used to protect the user's face, in addition to the eyes, from a variety of hazards.

Filter Lens — A lens that protects against various degrees of ultraviolet, visible, and infrared rays.

Goggles — Goggles fit the face directly surrounding the eyes and can be used as a primary protector, or in combination with other eye and face protection.

Optical Radiation — Ultraviolet, visible, and infrared radiation that falls in the region of transmittance of the human eye.

Primary Protector	Personal protective device such as spectacles or goggles that my be worn alone or in combination with a secondary protector.
Safety Glasses	Protective eye glasses with safety frames, tempered glass or plastic lenses which provide eye protection from moderate impact and particles.
Secondary Protector	Personal protective device that can only be worn in combination with a primary protector.
Side Shield	A device attached to the front of the frame designed to provide angular protection from impact hazards.
Spectacles	Protective devices intended to safeguard the wearer's eyes from a variety of hazards. Generally used to provide primary protection from impact and optical radiation.

REFERENCES

These documents and other sources of information can help you implement the requirements listed in the OSHA laboratory standard.

- American Conference of Governmental Industrial Hygienists (ACGIH), Guidelines for Selection of Chemical Protective Clothing, Third Edition, ACGIH 0460
- ACGIH, Quick Selection Guide to Chemical Protective Clothing, Fourth Edition, ACGIH 9090
- ANSI Z87.1, American National Standard Practice for Occupational and Educational Eye and Face Protection
- ANSI Z41, American National Standard for Personal Protection - Protective Footwear
- OSHA, Personal Protective Equipment, OSHA 3151, 2004.

Section 44-03
Roles and Responsibilities

EPA HEADQUARTERS

SHEMD is responsible for developing EPA Occupational Health and Safety policies, program standards, goals and objectives; for evaluating the effectiveness of the Agency's Occupational Health and Safety programs at all operational levels; and for providing technical support to the Agency's Occupational Health and Safety programs.

MANAGERS

SHEMP managers are responsible for the following:

- Ensure a hazard assessment, and subsequent re-assessment, is conducted to determine the hazards and/or potential hazards present in the workplace
- Ensure the appropriate PPE is selected
- Provide training on proper fit, use, care, and cleaning of PPE
- Review, update and evaluate the overall effectiveness of the PPE program
- Maintain records of the hazard assessments.

SUPERVISORS

SHEMP supervisors are responsible for the following:

- Make the appropriate PPE available to affected employees
- Ensure employees are trained on use and maintenance of PPE
- Maintain records of PPE training
- Notify the SHEMP manager when new hazards are introduced or processes are changed or added
- Ensure that defective or damaged PPE is immediately replaced.

EMPLOYEES

All affected EPA employees shall be responsible for the following:

- Wearing the PPE as required
- Participating in required training sessions
- Maintenance and care of the PPE
- Informing the supervisor of the need to replace the PPE.

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Section 44-04
Personal Protective Equipment Program

GENERAL REQUIREMENTS
29 CFR §1910.132

The main components of a PPE program include a hazard assessment of the workplace, protective equipment selection, and employee training.

When PPE is required, the SHEMP manager shall ensure that PPE is provided to all affected employees, at no cost to the employees. In addition, the SHEMP manager and/or supervisor shall ensure that PPE is worn properly and whenever required.

A workplace hazard assess shall be conducted at each SHEMD laboratory or facility to determine the hazards or potential hazards in the workplace.

When the hazard assessment has been performed, the SHEMP manager shall provide written certification of the workplace evaluation, identifying the person performing the evaluation, and the date of the evaluation.

When PPE is required, the SHEMP manager, or designee, shall:

- Select the appropriate PPE for the hazard(s) identified
- Offer a selection of PPE to the employees
- Provide training for all affected employees that addresses proper fit and use of PPE, its limitations, and maintenance and care of the PPE
- Ensure that the required documentation and/or records are maintained.

CONTROLS

One of the main goals of SHEMD is to reduce or eliminate employee exposure to workplace hazards. The SHEMP manager, or designee, shall evaluate the hazards and potential hazards, and implement engineering controls and administrative polices to control the hazard.

Engineering Controls

Engineering controls include design changes to equipment, installing equipment (e.g. local exhaust ventilation), and modifying work methods.

Administrative Controls

Administrative controls include modifying work practices (e.g. shorter workshifts), and implementing management policies and training programs.

When implementation of these controls are not feasible, or do not provide sufficient protection, PPE shall be used to protect the worker from the hazard.

TYPES OF PPE

Personal protective equipment includes equipment for eyes, face, head, extremities (e.g., hand and foot), protective clothing and respiratory devices. (Refer to SHEMP Guideline 46, Respiratory Protection Program, for information on respiratory protection, including respirators.)

Different types of PPE are used for protection against the following hazards (note: this list is not exhaustive):

- Chemical - corrosives; gases or vapors
- Environmental - noise; extreme temperatures; dust
- Biological - bloodborne pathogens; carcinogens
- Physical - impact; penetration
- Physiological - respiratory; absorption, inhalation
- Radiological - laser/light radiation.

Section 44-05
Workplace Hazard Assessment

INTRODUCTION

SHEMD shall ensure that workplace assessments are conducted to determine the hazards or potential hazards present which would require the use of PPE.

These assessments are conducted for all work areas and, where applicable, include:

- Laboratory and associated support facilities,
- Field operations, or
- Mobile facilities.

An example of a PPE Hazard Assessment Table is included in Appendix A. A blank form is also provided for your use. The locations of the workplace hazard assessments can be listed in Column 3 of the table.

WALK-THROUGH SURVEY

In order to assess the needs for PPE, the SHEMP manager or designee shall conduct a walk-through survey of the work areas and operations. This survey serves to identify sources of hazards or potential hazards in the workplace.

Appendix B provides an overview of hazard assessment survey guidelines and a checklist covering the general requirements of the OSHA PPE standard.

The hazards identified in the survey may be categorized as follows:

- **Impact** - e.g., flying fragments, chips or particles
- **Penetration** - e.g., sharp-pointed or -edged object
- **Compression (Roll-Over)** - e.g., vehicle wheel rolling over a worker's foot
- **Chemical** - e.g., solid, gas or liquid
- **Heat**- e.g,. furnace operations, welding
- **Cold** - e.g., working outdoors in extreme (cold) temperatures

- **Harmful Dust** - e.g., airborne dust from sanding operations
- **Light (Optical) Radiation** - e.g., arc welding/high intensity light.

Hazard Sources

During the walk-through survey, the assessor shall note the following possible sources of hazards:

- Motion (i.e., machinery or processes where movement of tools or movement of personnel could result in a collision with stationary objects)
- High temperatures that could result in heat stress, burns, or ignition of protective or other equipment
- Low temperature that could result in contact burns, skin lacerations, or frostbite
- Chemical exposure (e.g., inhalation, potential skin contact)
- Harmful dust
- Light radiation (e.g., welding, brazing, cutting, furnaces, heat treating, high intensity lights)
- Falling objects or potential for dropping objects
- Sharp objects which might pierce the feet or cut the hands
- Rolling or pinching objects that could crush the feet
- Electrical hazards.

The layout of the workplace and location of workers should also be noted in the workplace assessment.

Hazard Assessment

Each identified hazard shall be evaluated to determine the type and seriousness of potential injury. Exposure to multiple hazards shall also be considered.

WRITTEN CERTIFICATION

Written certification of the assessment is required. As part of that certification the following information must be identified in a written document:

- The work area(s) evaluated

- The person certifying that the evaluation has been performed
- The date(s) of the hazard assessment.

Appendix A includes an example of a written certification that may be used by SHEMP managers and other designated personnel.

PPE SELECTION

If the walk-through survey of the work areas has determined that hazards or potential hazards are present that require the use of PPE, the SHEMP manager, or designee, shall select the types of PPE that will be required.

All affected employees will be notified of the hazards or potential hazard(s) in the work area.

The manager shall ensure that the selected PPE properly fits each affected employee, and that all affected employees use the proper and required PPE.

WORKPLACE HAZARD RE-ASSESSMENT

The SHEMP manager or supervisor shall ensure that the workplace is re-assessed as necessary by:

- Identifying and evaluating new equipment and processes
- Reviewing accident records
- Re-evaluating the suitability of previously selected PPE.

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Section 44-06
PPE Selection Guidelines

GENERAL GUIDELINES

SHEMP managers, supervisors, or their designees, shall evaluate the potential hazards identified and consider the protective equipment required to protect against those hazards.

The capabilities of the selected PPE shall be evaluated against the hazards associated with the environment, and/or operations.

The PPE selected shall offer a protection level greater than the minimum required to protect the employees from the hazard.

The SHEMP manager or supervisor shall ensure that the user is 'fitted' with the protective device, and trained on care and use of the PPE. (Refer to Section 44-13, Training, in this SHEMP Guideline.)

CRITERIA FOR PPE

Eye and face protective devices shall comply with ANSI Z87.1-1989, American National Standard Practice for Occupational and Educational Eye and Face Protection.

Protective helmets shall comply with ANSI Z89.1-1986, American National Standard for Person Protection - Protective Headwear for Industrial Workers.

Protective footwear shall comply with ANSI Z41-1991, American National Standard for Personal Protection - Protective Footwear.

FITTING

The following guidelines are suggested when fitting the user with the protective device:

- Each user must be ensured comfort and fit of the selected PPE
- Affected employees shall be offered a variety of sizes of selected PPE
- Adjustments to PPE shall be made for each individual to ensure a proper fit (e.g., eye protection properly sealed to the face for protection against chemical splash)
- Helmets shall be properly fitted to ensure the helmets will not fall off during work operations

Fitting should comply with the manufacturer's recommendations.

Section 44-07
Selection Guidelines for Eye and Face Protection

GENERAL GUIDELINES

The SHEMP manager or supervisor shall ensure that affected employees use the appropriate eye or face protection when exposed to eye or face hazards, such as:

- Flying particles
- Molten metal
- Liquid chemicals, acids or caustic liquids
- Chemical gases or vapors
- Optical radiation.

Employees shall wear eye protection that is equipped with side protection for hazards from flying objects.

Eye and face PPE shall be distinctly marked with the identification of the manufacturer.

Eye and face protection equipment shall be kept clean and in good repair.

When there is an exposure to multiple and simultaneous hazards, the SHEMP manager, or supervisor shall ensure adequate protection against the highest level of each hazard.

PRESCRIPTION LENSES

Employees who wear prescription lenses while engaged in operations that involve eye hazards shall:

- Wear eye protection that incorporates the prescription in its design, or

- Wear eye protection (e.g., goggles) that can be worn over prescription lenses without disturbing the proper position of the lenses.

It should be noted that dusty and/or chemical environments may present additional hazards to contact lens wearers.

FILTER LENSES

Employees who work in operations that involve optical radiation, shall wear eye protection with filter lenses that have a shade number appropriate for the work being performed (e.g., welding, plasma arc cutting).

Refer to 29 CFR §1910.133(a)(5), for guidance in selecting the appropriate filter lens shade numbers for various operations.

SAFETY GLASSES

Tinted lenses will not be allowed unless required as part of the prescription eye correction, or required by the working conditions (e.g., hazardous area with welding operations).

Safety spectacles or lenses require special frames. Street-wear frames are not acceptable.

Glass lenses must be marked with the letter "H" to indicate treatment for impact resistance.

FACE SHIELDS

Face shields (and welding helmets) are considered secondary protectors and should only be worn over primary eye protection, such as spectacles or goggles.

Chin-length face shields shall be worn when eye, nose or mouth contamination is anticipated.

Face shields, when worn over primary eye protection, protect the *entire* face from:

- **Chemical hazards** - e.g., splash from liquid chemicals
- **Infectious materials** - e.g., droplets of blood, and other potentially infectious materials
- **Heat hazards** - e.g., high temperatures and hot sparks
- **Impact hazards** - e.g., flying fragments, and large particles/chip.

Section 44-08
Selection Guidelines for Head Protection

GENERAL GUIDELINES

Affected employees shall wear protective helmets when working in areas where there is a potential for injury to the head from falling or flying objects, impact, or electrical shock and burns.

The shell of the protective helmet is designed to resist the impact and the headband and crown straps keep the shell away from the user's skull.

Helmets designed to reduce electrical shock hazards shall be worn by employees working near exposed electrical conductors that could contact the head.

HELMET CLASSES

When selecting head protection, the following three classes of helmets shall be evaluated for the most adequate protection for the corresponding hazard(s):

Class	Protection
Class A Helmet	• Impact and Penetration resistance • Provides electrical protection from low-voltage conductors • Proof-tested to 2,200 volts
Class B Helmet	• Impact and Penetration resistance • Provides electrical protection form high-voltage conductors • Proof-tested to 20,000 volts
Class C Helmet	• Impact and Penetration resistance • Should **NOT** be used around electrical hazards as these helmets are usually made of aluminum, which conducts electricity.

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Section 44-09
Selection Guidelines for Foot Protection

GENERAL GUIDELINES

Affected employees shall use protective footwear when working in areas there is a danger of foot injuries due to falling and rolling objects, objects piercing the sole, and where the employee's feet are exposed to electric hazards.

SAFETY SHOES/BOOTS

Safety shoes and boots that are used as protective footwear shall provide the following types of protection to the user:

- Impact and compression
- Puncture
- Electrical conductive or insulating.

The SHEMP manager or designee, shall determine and select the appropriate foot protection required.

Safety shoes are also designed to insulate against temperature extremes and may be equipped with special soles to guard against slip, chemicals, and/or electrical hazards.

The following types of safety boots offer protection against various splash or spark hazards:

- Neoprene or nitrile boots are used when working with corrosives, caustics, cutting oils and petroleum product

- Foundry or "gaiter" style boots are equipped with quick-release fasteners to allow quick removal if hazardous substances come in contact with the boot

- Special electrical hazard boots are designed with no conductive materials (other than the steel toe, which is properly insulated) to offer protection when working with electricity.

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Section 44-10
Selection Guidelines for Hand Protection

GENERAL GUIDELINES

Hand protection is used to protect the user against cuts, abrasions, heat, and skin contact with chemicals or other hazardous substances.

No one glove provides protection against all hand hazards, and commonly available gloves provide limited protection against many chemicals. Therefore, it is important to select the most appropriate glove for a particular application.

GLOVE SELECTION

The SHEMP manager or designee, shall select the appropriate glove for use against the potential hazards. The following factors must be considered in the selection process:

- Performance characteristics of the gloves - refer to manufacturer's specifications
- Work activities of the employee to determine degree of dexterity required
- The duration, frequency, and degree of exposure to the hazard
- Physical stresses that may be applied to the glove.

To determine the appropriate glove for protection against chemical hazards the following must be considered:

- The toxic properties of the chemical(s) - the ability of the chemical to cause local effects on the skin and/or to pass through the skin and cause systemic effects
- Using "chemical resistant" gloves for dry powders
- The chemical component with the shortest break-through time, when working with mixtures and formulated products (unless specific test data are available)
- The manner in which employees are able to remove the gloves, as to prevent skin contamination.

Glove Guide

The following are common types of protective work gloves and the types of hazards they can guard against.

Type	Composition	Hazard/Application
Disposable Glove	Light-weight plastic	• Mild irritants
Fabric Glove	Cotton or fabric blend	• Improve grip when handling slippery objects • Insulate from mild heat or cold
Leather Glove	Leather	• Sparks or rough surfaces • Used with insulated liner when working with electricity
Metal Mesh Glove	Metal	• Cuts and scratches • Used when working with cutting tools or sharp instruments
Aluminized Glove	Aluminized fabric	• Intense heat • Used when working with molten materials
Chemical Resistant Glove	Rubber, neoprene, polyvinyl alcohol, vinyl, etc.	• Corrosives • Oils • Solvents

Section 44-11
Selection Guidelines for Laboratory and Chemical Protective Clothing

GENERAL GUIDELINES

Chemical protective clothing is used to shield the user from chemical, physical, and biological hazards. Protective clothing shall be worn when there is a potential for chemical exposure from the following activities (note: this list is not exhaustive):

- Laboratory operations/activities
- Emergency response
- Hazardous waste clean-up and disposal
- Asbestos removal
- Agricultural application of pesticides.

It should be noted that the use of full body chemical protective ensembles (clothing and equipment) may cause heat and physical stress, impaired vision or impaired mobility for the user.

CLOTHING ENSEMBLE

The SHEMP manager or designee, shall select the appropriate equipment and clothing that will provide an adequate level of protection while allowing the user to carry out the task activities.

To select the appropriate ensemble, the following factors shall be considered:

- Chemical hazard(s)
- Physical environment
- Duration of exposure
- Clothing and equipment compatibility.

CLASSIFICATION OF CHEMICAL PROTECTIVE CLOTHING

Chemical protective clothing may be classified by:

- Design
  - Gloves
  - Boots
  - Aprons, jackets, coveralls
  - Full body suit

- Performance
  - Particulate protection
  - Liquid-splash protection
  - Vapor protection

- Service Life
  - Single use
  - Limited use
  - Reusable.

PPE IN LABORATORIES

Lab coats may be used to protect street clothing against biological and chemical spills.

The SHEMP manager, or designee, shall select lab coats based on evaluation of the specific hazard(s) of the substances used and the degree of protection required.

Biological Agents

For biological agents, the SHEMP manager and laboratory supervisor, or designee, shall determine the Biosafety Level for the lab and the appropriate type of PPE required to be worn in the lab.

Radioactive Materials

Employees working with radioactive materials shall follow requirements provided by the SHEMP Radiation Safety Officer, or contact their supervisor for more information.

Foot Protection

For general laboratory use, comfortable shoes (e.g., tennis shoes) shall be worn.

Sandals and other types of open-toed foot wear is not permitted in labs using biohazards or chemicals.

Boots and shoe covers may be required for certain labs. Consult with the laboratory supervisor, or SHEMP manager for appropriate foot protection.

Eye and Face Protection

Eye protection shall be worn at all times, when working in laboratories with chemical or other hazardous substances. Face shields, safety glasses or goggles may be used as eye protection.

Appropriate eye and face protection shall be worn by all employees entering animal rooms.

Hand Protection

Gloves shall be worn in laboratories when there is a potential for contact with chemicals, biohazards, or infectious materials.

Section 44-12
Cleaning and Maintenance

INTRODUCTION

All PPE shall be kept clean and properly maintained. Employees shall be responsible for maintaining their individually assigned PPE.

Supervisors shall ensure that PPE is inspected, and cleaned and maintained regularly, and that contaminated PPE is properly disposed.

PPE MAINTENANCE

The following are recommended practices for PPE maintenance:

- All PPE must be used and maintained in a sanitary condition
- Visually inspect all PPE before and after use
- All components of the safety helmet – shells, suspensions, headbands, sweatbands, etc. – shall be visually inspected daily, or before use, for signs of dents, cracks, penetration, or other damage that may reduce the degree of protection
- Pitted lenses which can no longer be cleaned, may reduce vision and must be replaced
- PPE that is worn out, with structural and optical defects, and with components/materials that have been compromised, must be replaced.

PPE CLEANING

The following are recommended practices for PPE cleaning:

- All PPE shall be cleaned and maintained at regular intervals to maintain the required protection
- PPE previously used must be disinfected or thoroughly cleaned before being issued to another employee
- Eye and face protection shall be kept clean; dirty or fogged lenses may impair vision
- Eye and face protection shall be disassembled, and cleaned with mild soap and warm water

- Follow cleaning procedures recommended by the manufacturer prior to cleaning helmets; some cleaning solutions may compromise the integrity of the shell, thereby reducing the protection

- Always follow manufacturer's recommendations for cleaning PPE.

STORAGE

The following are recommended practices for PPE storage:

- Goggles shall be kept in a case, or similar, when not in use

- Spectacles shall be given the same care as one's own glasses, since the frame, nose pads, and temples can be damaged by rough usage

- Helmets shall not be stored on the rear window shelf of an automobile, since sunlight and extreme heat may adversely affect the degree of protection

- Other PPE shall be stored in a clean, dust-proof container or bag when not in use.

Section 44-13
Training

GENERAL GUIDELINES

The SHEMP manager shall provide training to all employees required to use PPE. The training shall address, at a minimum, the following:

- When PPE is necessary
- What type of PPE is required
- How to properly wear/use PPE
- Limitation of the PPE
- Proper maintenance, use and care of PPE
- Useful life and disposal of PPE.

All employees required to wear PPE must participate in the required training. Affected employees will not be allowed to perform the work requiring the use of PPE unless each has demonstrated:

- An understanding of the training
- The ability to properly use the PPE.

CERTIFICATION

The SHEMP manager, or designee, shall verify by written certification that the employee using the PPE has received and understood the training. The written certification shall contain the following information:

- Name of employee
- Date(s) of training
- Subject of the training/certification.

RETRAINING

Retraining shall be conducted in any of the following situations:

- Changes in the workplace that render previous training obsolete
- Changes in the types of PPE render previous training obsolete
- The affected employee has demonstrated that he/she has not retained the understanding of, or skill to use the assigned PPE.

RECORDKEEPING

The SHEMP manager, and/or supervisor shall be responsible for maintaining, and updating the employees' training records.

The form in Appendix D, Equipment and Training Form, may be used as a reference for maintaining written documentation of training.

All training records shall include the name of employee trained, the date(s) of training, the subject of the training, and the name of the trainer.

All employee training records shall be maintained at the employee's work facility.

APPENDIX A
PPE Hazard Assessment Table and Written Certification

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PPE Hazard Assessment Table - Sample

1. HAZARD SOURCE[1]	2. OPERATION	3. ROOM/ AREA	4. HAZARD - ASSESSMENT OF HAZARDS	5. RISK	6. PPE	7. PPE CRITERIA[2]
Chemicals in the laboratory	Laboratory operations	All labs	Splash - acids and chemicals during handling. Absorption - acids and chemicals during handling.	Burns and irritation to hands, face, body. Irritation of and absorption into the skin, hands and eyes.	Spectacles* Lab coat Shoes Gloves	Z87 Full length No open toes Chemical specific (see below)
Generic chemical and product handling	Laboratory operations	All labs	Contact - chemicals and dusts during handling.	Contamination of the skin.	Gloves	Latex, nitrile or PVC
Acids	Preparing the acid solutions for glassware washing	Re 185	Splash - acids and chemicals during handling.	Burns and irritation to hands, face, body.	Gloves Apron Face shield Goggles	Nitrile Rubber - Splash
Solvents	Transfer of liquids, greater than 4 liters	All labs	Absorption - acids and chemicals during handling.	Irritation of and absorption into the skin, hands and eyes.	Gloves Goggles	Chemical specific Splash
Methylene Chloride	Organic sample preparation and analysis	Rms 177a, 178, 179	Absorption - acids and chemicals during handling.	Irritation of and absorption into the skin, hands and eyes.	Gloves	Viton
Diazomethane	Methylation (generating diazomethane)	Rm 181	Impact from explosions.	Cuts and lacerations to face and eyes.	Gloves Spectacles with face shield Explosive shielding	Nitrile - See manufacturer
Perchlorates	Perchlorination	Rm 181	Impact from explosions.	Cuts and lacerations to face and eyes.	Gloves Explosive shielding	Nitrile See manufacturer
Heat	Hotplates Autoclave Ovens	Throughout Rm 185 Rms 185, 197, 204	Contact - during the handling of hot glassware.	Burns to the hands and arms.	Gloves	Insulated
Sharp Objects	Laboratory	All labs	Sharp objects such as needles and broken glassware.	Cuts to hands and skin.	Gloves	Leather or heavy duty knit lined rubber

1. HAZARD SOURCE[1]	2. OPERATION	3. ROOM/ AREA	4. HAZARD - ASSESSMENT OF HAZARDS	5. RISK	6. PPE	7. PPE CRITERIA[2]
Compression	Cylinders	Lab and warehouse	Moving and rolling cylinders (gas and cryogenic) and containers (including drums in the warehouse).	Crushing of the foot.	Shoes	Steel toes
Impact	Drill Press	Rm 203	Impact from flying fragments, objects, large chips, etc.	Irritation or damage to the eye.	Spectacles	Z87, with side shields

[1] Categories include: Impact; Penetration; Compression; Chemical; Heat; Harmful dust; Light radiation; Noise; Electrical.

[2] Footwear = ANSI Z41.1991; Head protection = ANSI Z89.1 1986; Hand protection = PPE Program; Eye and face protection = ANSI Z 87.1 1989; Electrical protection = ASTM D120-87.

[3] Spectacles are being specified for laboratory splash hazards for both laboratory operators and visitors. Spectacles are considered a downgrade for laboratory operators and an upgrade for visitors. Spectacles are required only in laboratory rooms, and only during ongoing operations other than auto sampling and administrative tasks (e.g., using computers). Goggles are preferable for laboratory operations where the splash hazard is greater (e.g., transferring liquids from containers at least 4 liters in volume), or during the bulk handling of chemicals and wastes.

[4] Viton gloves may not offer the dexterity needed to perform the operation. Latex or Nitrile gloves, if in contact with Methylene Chloride, may contaminate the sample. Gloves need to be disposed of as soon as they become deteriorated (i.e., minutes after contact for Nitrile and Latex, up to weeks for Viton).

Assessment performed by: _____ Date: _____

PPE Hazard Assessment Table

1. HAZARD SOURCE	2. OPERATION	3. ROOM/ AREA	4. HAZARD - ASSESSMENT OF HAZARDS	5. RISK	6. PPE	7. PPE CRITERIA

Assessment performed by: _____ Date: _____

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APPENDIX B
Hazard Assessment Survey Guidelines and PPE Checklist

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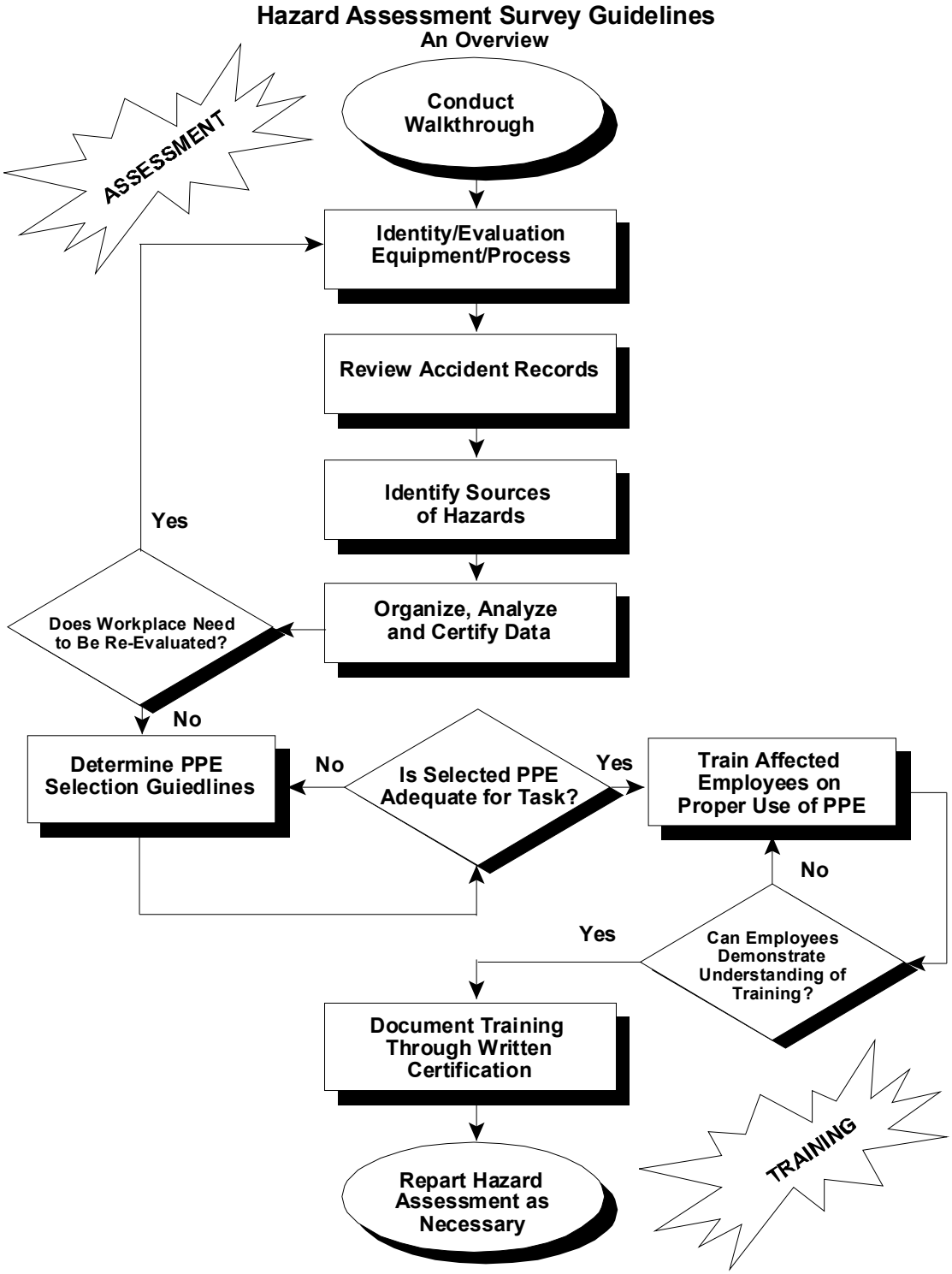
Hazard Assessment Survey Guidelines
An Overview
ASSESSMENT
Conduct Walkthrough
Identity/Evaluation Equipment/Process
Review Accident Records
Identify Sources of Hazards
Organize, Analyze and Certify Data
Does Workplace Need to Be Re-Evaluated?
Yes
No
Determine PPE Selection Guiedlines
No
Is Selected PPE Adequate for Task?
Yes
Train Affected Employees on Proper Use of PPE
No
Can Employees Demonstrate Understanding of Training?
Yes
Document Training Through Written Certification
Repart Hazard Assessment as Necessary
TRAINING

PPE Checklist

	Yes	No
1. Has the workplace been assessed to determine if hazards that require the use of head, eye, face, hand, or foot protection are present or are likely to be present?	☐	☐
(a) Did the assessment include an identification and evaluation of equipment and processes?	☐	☐
(b) Were accident records reviewed?	☐	☐
(c) Were the sources of hazards identified?	☐	☐
(d) Is the selected PPE adequate for the task?	☐	☐
If the PPE is inadequate, were PPE selection guidelines subsequently determined?	☐	☐
2. Have all affected employees been trained on the proper use of PPE?	☐	☐
3. Can employees demonstrate an understanding of the training?	☐	☐
4. Has training been documented through written certification?	☐	☐
5. Have any of the following situations occurred that require a re-evaluation of the workplace?	☐	☐
(a) The purchase of any new types of PPE?	☐	☐
(b) The procurement of new equipment or facilities?	☐	☐
(c) The introduction of new operations or procedures?	☐	☐
6. If you answered yes to any of the questions in question 5, was the workplace re-evaluated using questions 1 through 4?	☐	☐

APPENDIX C
Instructions for Completing the Job Hazard Analysis

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INSTRUCTIONS FOR COMPLETING THE JOB HAZARD ANALYSIS

Job Hazard Analysis (JHA) is an important prevention tool that works by finding hazards and eliminating or minimizing them *before* the job is performed and *before* they become accidents. Use JHA for job clarification and hazard awareness, as a guide in new employee training, for periodic contacts and for retraining of senior employees, as a refresher on jobs which run infrequently, as an accident investigation tool, and for informing employees of specific job hazards and protective measures.

Set priorities for doing JHAs: jobs that have a history of many accidents, jobs that have produced disabling injuries, jobs with high potential for disabling injury or death, and new jobs with no accident history.

Select a job to be analyzed. Before filling out this form, consider the following:

- The purpose of the job – What has to be done? Who has to do it?
- The activities involved – How is it done? When is it done? Where is it done?

In summary, to complete this form you should consider the purpose of the job, the activities it involves, and the hazards it presents. If you are not familiar with a particular job or operation, interview an employee who is familiar with the job or operation. In addition, observing an employee performing the job, or "walking through" the operation step by step may give additional insight into potential hazards. You may also wish to videotape the job and analyze it. Here's how to do each of the three parts of a Job Hazard Analysis.

SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS	RECOMMENDED ACTION OR PROCEDURE
Examining a specific job by breaking it down into a series of steps or tasks will enable you to discover potential hazards that employees may encounter. Each job or operation will consist of a set of steps or tasks. For example, the job may consist of moving a box from a conveyor in the receiving area to a shelf in the storage area. To determine where a step begins or ends, look for a change of activity, change in direction or movement. Picking up the box from the conveyor and placing it on a hand truck is one step. The next step may be to push the loaded handtruck to the storage area (a change in activity). Moving the boxes from the truck and placing them on the shelf is another step. The final step may be returning the hand truck to the receiving area. Be sure to list *all* the steps needed to perform the job. Some steps may not be performed each time; an example could be checking the casters on the hand truck. However, if that step is generally part of the job, it should be listed.	A hazard is a potential danger. The purpose of the Job Hazard Analysis is to identify ALL hazards - both those produced by the environment or conditions and those connected with the job procedure. To identify hazards, ask yourself these questions about each step: Is there a danger of the employee striking against, being struck by, or otherwise making injurious contact with an object? Can the employee be caught in, by, or between objects? Is there potential for slipping, tripping, or falling? Could the employee suffer strains from pushing, pulling, lifting, bending, or twisting? Is the environment hazardous to safety and/or health (toxic gas, vapor, mist, fumes, dust, heat, or radiation)? Close observation and knowledge of the job is important. Examine each step carefully to find and identify hazards - the actions, conditions, and possibilities that could lead to an accident. Compiling an accurate and complete list of potential hazards will allow you to develop the recommended safe job procedures needed to prevent accidents.	Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the hazards that could lead to an accident, injury, or occupational illness. Begin by trying to: 1) engineer the hazard out; 2) provide guards, safety devices, etc.; 3) provide personal protective equipment; 4) provide job instruction training; 5) maintain good housekeeping; 6) ensure good ergonomics (positioning of the person in relation to the machine or other elements to improve safety). List the recommended safe operating procedures. Begin with an action word. Say exactly what needs to be done to correct the hazard, such as, "lift using your leg muscles." Avoid general statements such as, "be careful." List the required or recommended personal protective equipment necessary to perform each step of the job. Give a recommended action or procedure for each hazard. Serious hazards should be corrected immediately. The JHA should then be changed to reflect the new conditions. Finally, review your input on all three columns for accuracy and completeness. Determine if the recommended actions or procedures have been put in place. Re-evaluate the JHA as necessary.

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APPENDIX D
Equipment and Training Form

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Receipt and Acknowledgment of Personal Protective Equipment and Training

When the job warrants, employees must use or wear personal protective equipment. This equipment will be provided by the Agency. Each employee will be responsive for the care and storage of his or her personal protective equipment.

Training shall be provided regarding the type of protection needed and how to use, inspect, wear, clean, and store such equipment. Training will also include hazard identification and reduction.

Supervisors shall be responsible for monitoring work practices and enforcing the proper use of personal protective equipment.

EQUIPMENT CHECKLIST

NAME _____ DIV/BRANCH _____

JOB CLASSIFICATION _____

SSN _____—_____—_____ PHONE NO. _____

TYPE OF EQUIPMENT	DATE	TRAINER

I have been given the above noted equipment and have been trained in its use. I understand why it is necessary to use such equipment and I agree to use it.

Employee Signature: _____ Date: _____

This certifies that the above named employee has been provided with the above noted equipment and has completed training in the use of the equipment.

Health & Safety Designee: _____ Date: _____

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